

and $8^{\circ} 13'$ N. lat.; the Atlantic Ocean immediately west of Africa therefore formed the horizon or bounding surface on the west and the Pacific Ocean immediately east of Australia on the east. It is not therefore improbable that the conditions for illumination were favourable; as a matter of fact, with the exception of the obscuration of the western limb and the darkness of the large plains when near the centre of the shadow, all the prominent features of the Moon were distinctly visible, especially the bright mountain *Aristarchus*, and even the diverging rays from *Tycho* and *Copernicus* could generally be seen.

During the Eclipse a number of Occultations of neighbouring small stars occurred. One only was noted, viz. a star of about the 10th magnitude, which disappeared at the north-east limb, at $16^h 47^m 3^{s.7}$ A.M.T., corresponding to $7^h 32^m 42^{s.4}$ G.M.T., appearing to hang on the dark edge of the limb, which was sharply defined, for two or three seconds.

Partial Eclipse of the Sun, February 2, 1878.

(Observer, Mr. Ringwood.)

The commencement of the Eclipse was well observed here with the 8-inch Equatoreal; the first surface reflection eye-piece, with a power of 67, was used. The first contact was noted at February 2, $5^h 42^m 35^{s.0}$ Adelaide mean time, corresponding to February 1, $20^h 28^m 13^{s.7}$ Greenwich mean time, and may be a second or two late. No spots were visible with power 120; the Moon appeared very black by contrast, but, when the Sun was out of the field of view, it was palely illuminated by Earth-light, no lunar features being, however, discernible; weather fine, passing clouds.

Observations of the solar thermometer were not taken, on account of the passing clouds, but the shade temperature was continually watched, nothing of importance being recorded.

Transit of Mercury, May 6, 1878.

(Observer, Mr. Ringwood.)

The Egress was observed here under very favourable conditions, the definition being very fair considering the low altitude of the Sun; the 8-inch Equatoreal, with the double micrometer eye-piece and a power of 140, was used. The Adelaide mean time of internal contact at egress was noted as May 6, $19^h 59^m 32^{s.1}$ and the external contact as $20^h 2^m 36^{s.5}$, corresponding respectively to May 6, $10^h 45^m 10^{s.8}$ and $10^h 48^m 15^{s.2}$ Greenwich mean time; the egress took place at about $101^{\circ} 42'$ west of the north pole of the Sun.

When the planet was very close to the Sun's limb, which was

a little tremulous, the wavy surface appeared to touch the limb of the planet at times, and the time given of internal contact is when the continuity of the limb was first permanently broken and was considered very exact; there was nothing approaching the phenomenon of the black drop, nor was the planet at all distorted, though the slight boiling motion might (for the shortest possible moment) give one the idea of a fine line or hair joining the two bodies, but nothing definite or decided was seen. The planet was not in the faintest degree visible after passing off the Sun's disk. No sunspots were seen.

Meteor Showers derived from Foreign Observations: July to December. By W. F. Denning, Esq.

The showers given in the Table which follows were selected from a large number of such positions resulting from the projection of several thousand meteor-paths in the Catalogues of Heis, Weiss,[†] Schiaparelli (1872), Zezioli, and Konkoly. They occur during the last half of the year and afford examples of well defined and active radiants, many of which will no doubt be frequently reobserved in future years. The list includes 79 of these meteor-streams, and 1,874 shooting stars were found conformable to them, giving an average of nearly 24 for each centre. The periods assigned are merely approximate. They relate simply to the dates for which the reductions were undertaken and afford no clue to the whole duration of many of the showers. Any extended references here to these newly ascertained centres are rendered unnecessary by the column of Notes affixed to them, in which many agreements and comparisons with old showers are specified; but in a few cases it seems desirable to add some particulars to what is already mentioned in the Table. The first group of reductions are for July 25–31, when the *Perseids* (No. 4) formed the most active shower and there were good contemporary radiants near θ *Persei* (No. 5) and β *Persei* (No. 3). The major shower of *Perseids* (near η *Persei*, showing a strong maximum on August 10) appears to continue certainly until the middle of September from precisely the same diverging focus as in July (compare Nos. 4 and 30 in the list). July also furnishes a good radiant close to ψ *Cassiopeiæ* which is well confirmed by Greg and Herschel and Heis, and further supported by a first magnitude stationary meteor observed by Billerbeck, at Rastenburg, on July 28, 1851, at $12^{\circ} + 76^{\circ}$, though the position is rather too far north. For August 6–12 there are some extremely well marked showers eastwards of the usual *Perseids*, several of which were already discovered by Heis in the years 1833–75, or by myself during a